



The Combustion Institute

5001 Baum Boulevard, Suite 644

Pittsburgh, Pennsylvania 15213-1851 USA

Ph: (412) 687-1366

office@combustioninstitute.org

<https://www.combustioninstitute.org/>

Prof. Dr.-Ing. Mirko R. Bothien

2024 Candidate Profile: The Combustion Institute Board of Directors

Reasons for Nomination

I'm convinced that combustion of carbon-free and -neutral fuels will play an important role in the future. Both for funding much-needed research and development activities and for recruiting and fostering new talents it is of utmost importance that we interact with the public to raise awareness. For this, it is crucial that academia and industry work hand in hand. Recently, interaction with industry has improved and I have contributed to this as Program Advisor and Colloquium Co-Chair of the 38th Symposium. I'd like to intensify the interaction based on my 15+ years industry experience in combustion R&D.

In particular, I'd like to contribute by:

- 1) Using my industry network to intensify interaction and exchange with the CI.
- 2) Increasing exchange with other combustion communities (through my leadership role in the ASME Combustion, Fuels and Emissions Committee where industry and academia closely interact) and funding agencies (e.g. Clean Hydrogen Partnership, where I have been joint road map lead and responsible for the last three calls on hydrogen combustion).
- 3) Promoting outreach activities to the public and future researchers and engineers.
- 4) Building links with related research areas, e.g., data science, which has many overlaps with my main technical expertise: combustion dynamics.



See the next page for the candidate's curriculum vitae.

My R&D work is dedicated to applying fundamental research to real-world industry problems by trying to develop creative and innovative solutions. Having been tackling the various challenges arising for ultra low-NOx combustion from an industrial point of view for more than 15 years (at Alstom, Ansaldo Energia and Siemens), I have recently accepted academic positions in Switzerland (Zurich University of Applied Sciences, 2020) and Norway (Norwegian University of Science and Technology, 2021). My goal is to continue the research I have been doing in industry changing the view angle to a more fundamental perspective without losing sight of the practical application. Leveraging my network both in industry and academia I seek to make a change for the future energy system.

EMPLOYMENT HISTORY (ONLY MOST RECENT)

Since 05/23 **Head of Renewable Energy**, Institute of Energy Systems and Fluid Engineering, ZHAW
 Since 01/21 **Associate Professor**, Department of Energy and Process Engineering, NTNU Trondheim
 Since 08/20 **Head of Distributed Energy Systems Lab, Senior Lecturer**, IEF, ZHAW
 04/18 – 06/22 **Rudolf Diesel Industry Fellow**, Institute for Advanced Study, TU Munich
 02/17 – 07/20 **Head of Combustor Technology**, Gas Turbine R&D, Ansaldo Energia Switzerland
 03/17 – 07/20 **Member of Board**, Norwegian CCS Research Centre
 02/09 – 01/17 **Expert and Team Leader Thermoacoustics**, Gas Turbines R&D, Alstom Power

EDUCATION

06/05 – 12/08 **Dr.-Ing. in Mechanical Engineering**, Institute of Fluid Mechanics and Acoustics, TU Berlin
 10/01 – 05/05 **Dipl.-Ing. in Mech. Engineering**, Turbo-machinery and Jet Propulsion, RWTH Aachen University
 10/99 – 09/01 **Undergraduate Studies**, Mechanical Engineering, University of Technology Darmstadt

SCIENTIFIC RECORD, SELECTED PUBLICATIONS & AWARDS

Overview

- Overview on Publications and patents: [Google Scholar ID](#), [Scopus ID](#), [Patents @ EPO](#)
- 95 technical publications (38 in peer-reviewed Journals & 29 in peer-reviewed conference proceedings)
- 52 patents on combustion dynamics, gas turbine fuel flexibility and operation

Selected Publications

- Aesøy, E., Aguilar, J., Wiseman, S., **Bothien, M.**, Worth, N., Dawson, J., Scaling and Prediction of Transfer Functions in Lean Premixed H₂/CH₄-Flames, *Combustion and Flame*, 215:269-282, 2020. – 65 citations
- Konduri, A., Gruber, A., Xu, C., Lu, T., Krisman, A., **Bothien, M. R.**, Chen, J. H., Direct numerical simulation of flame stabilization assisted by autoignition in a reheat gas turbine combustor. *Proc. of The Combustion Institute*, 37(2):2635-2642, 2019. – 86 citations
- **Bothien, M. R.**, Ciani, A., Wood, J. P., Fruechtel, G., Toward Decarbonized Power Generation With Gas Turbines by Using Sequential Combustion for Burning Hydrogen, *Journal of Engineering for Gas Turbines and Power*, 141(12):121013-1-10, 2019. – 104 citations

Selected Awards

2022 & 2015 ASME IGTI Best Paper Award Combustion, Fuels & Emissions Committee
 2021 Best Technical Paper Award, Symposium on Thermoacoustics in Combustion
 2018 Early Career Award, Global Power and Propulsion Society
 2015 Gold Medal Alstom Corporate Innovation Award
 2011 & 2010 Alstom Gas Turbine Invention Award

SERVICES TO THE COMMUNITY

- **The Combustion Institute**
 - Member of Program Advisory Committee
 - Colloquium Co-Chair: Gas Turbine and Rocket Engine Combustion, 38th Int. Symposium on Combustion
- **Combustion, Fuels & Emissions Committee** ASME IGTI Turbo Expo
 - Since 2018: Member of the Leadership Team, responsible for technical program organization for Turbo Expos 2019, 2020, 2022 & 2023
 - Since 2013: Session Organizer and Chair of 10+ technical sessions and panel sessions
- **Co-Organization** of Symp. on Thermoacoustics in Combustion: Industry meets Academia, 2021 & 2023
- **Associate Editor** Journal of Engineering for Gas Turbines and Power
- **Reviewer** for Combustion and Flame, Int. Symposium of Combustion, Journal of Sound and Vibration, Progress in Energy and Combustion Science, ASME Turbo Expo, Journal of Fluid Mechanics, Int. Journal of Spray and Combustion Dynamics, Applied Acoustics, Applied Energy, AIAA Journal